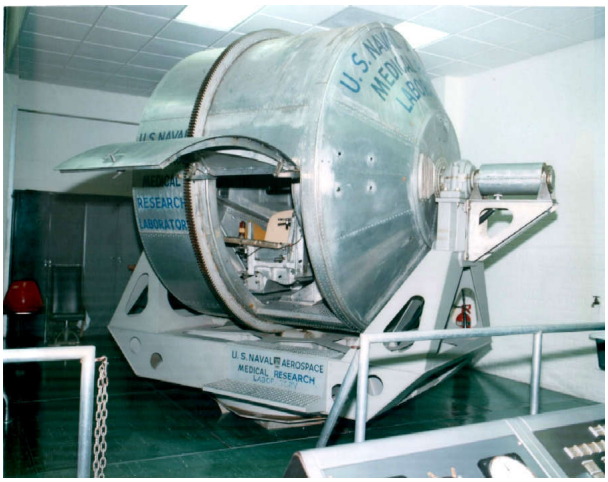
Sopite Syndrome: Cognitive, Affective, and Performance Effects and the Impact On Naval Aviation

Ben Lawson, Ph.D.
Naval Aerospace Medical Research Laboratory, 51 Hovey Road,Pensacola, Florida 32508-1046
(850) 452-2504
blawson@namrl.navy.mil

The term 'sopite syndrome' was first coined at this laboratory by Graybiel and Knepton to describe a "sometimes sole manifestation of motion sickness." They noted that subjects who had adapted to long periods in a rotating room, and no longer experienced nausea, continued to experience extreme fatigue and drowsiness. These subjects also showed cognitive and affective changes, including reduced motivation, irritability, depression, and difficulty concentrating. In contrast, subjects who lacked functioning vestibular systems did not exhibit these effects. Although the hazards of fatigue and drowsiness in transportation settings are well established, little research has examined the contribution of motion stimuli to these effects.

The Sopite Syndrome is characterized by drowsiness, fatigue, difficulty concentrating, apathy, mental depression, biochemical changes, and sleep disturbances. It is frequently the sole observable manifestation of motion sickness (MS), and its symptoms usually go unrecognized by untrained observers. Hence, sopite-related fatigue effects are rarely attributed to the stimuli that have caused them. Furthermore, there exist documented perceptual, cognitive, and performance deficits attributable to unusual motion. Systematic study is needed to determine the extent to which these deficits are attributable to acute MS and to the sopite syndrome. Long-lasting sopite-like symptoms have been noted in operationally relevant settings, such as simulator training and space flight. The vast majority of research conducted on MS to date has concerned the acute form of MS, with highly provocative stimuli and short exposure times. As more research is conducted with chronic low-grade stimuli (e.g., simulator training and training in virtual environments), we should expect to see more frequent and stronger sopite effects reported by users.

Phase 1 of our research seeks to determine whether evidence of the sopite syndrome exists in aviation training settings, such as ground and air-based aviation training programs at Pensacola Naval Air Station. Insights from these studies will be refined in Phases 2-3 by controlled laboratory experiments evaluating subjective, physiological, and performance changes during exposure to NAMRL's Human Disorientation Device (see figure). Phase 4 entails disseminating our findings to the fleet and drafting specific recommendations for mitigating sopite. This research project has generated nine abstracts and two research papers since it was begun in 1997.



We have also provided fleet support by giving two lectures at the Annual Naval Aeromedical Problems Course, one lecture at the Naval Operational Medical Institute Flight Surgeon Grand Rounds, and one presentation to the Human Factors Engineering Technical Advisory Group.